



400 Commonwealth Drive, Warrendale, PA 15096-0001

SURFACE VEHICLE STANDARD

SAE J1548

REV.
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Submitted for recognition as an American National Standard

(R) DRAWBARS—AGRICULTURAL WHEEL TRACTORS

1. Scope

1.1 This SAE Standard provides dimensions and vertical static load limits for drawbars of agricultural wheel type tractors.

1.1.1 To facilitate interchangeability of towed implements and wheeled type tractors within established power categories.

1.1.2 To facilitate interchangeability of drawbar attachments such as drawbar extenders and safety chain attachments.

1.1.3 To provide limits for the vertical static loads imposed by towed implements.

1.1.4 To provide dimensions relating the drawbar to the tractor power take-off shaft.

1.2 Dimensions comprising the standard specifications are divided into four categories as shown in Table 1:

TABLE 1—STANDARD SPECIFICATIONS

| Category | Maximum Drawbar Power kW (P) |
|----------|------------------------------|
| I | 15—35 |
| II | 30—75 |
| III | 60—170 |
| IV | 135—300 |

2. References

2.1 Applicable Documents—The following publications form a part of this specification to the extent specified herein.

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2.1.1 **SAE PUBLICATIONS**—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J708 DEC84—Agricultural Tractor Test Code
 SAE J711 MAR91—Tire Selection Tables for Agricultural Machines of Future Design
 SAE J1170 JUN91—Rear Power Take-off for Agricultural Tractors
 SAE J2708 SEP88—Agricultural Tractor Test Code (OECD)

2.1.2 **ASAE PUBLICATIONS**—Available from ASAE, 2950 Niles Road, St. Joseph, MI 49085-9659.

ASAE S338—(ANSI/ASAE S338)—Safety Chain for Towed Equipment

2.2 Related Publications—The following publications are provided for information purposes only and are not a required part of this document.

2.2.1 **SAE PUBLICATIONS**—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J715 OCT88—Three Point-Link Attachment for Hitching Implements to Agricultural Tractors
 SAE J721 MAY87—Operating Requirements for Tractor and Power Take-Off Driven Implements

2.2.2 **ISO PUBLICATIONS**—Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ISO 500—Agricultural tractors—Power take-off and drawbar
 ISO DIS 6489-3, 1990—Agricultural vehicles—Mechanical connections on towing vehicles—Part 3: Tractor drawbars

2.3 Definitions

2.3.1 **MAXIMUM DRAWBAR POWER** is that obtained per SAE J708 and J2708.

2.3.2 **REGULAR DRAWBAR**—The operating position of the drawbar, matching the standard dimension from hitch pin hole to end of PTO shaft for the particular type PTO shaft on the tractor.

2.3.3 **EXTENDABLE DRAWBAR**—An adjustable multiple operating position drawbar matching the standard dimension from hitch pin hole to end of PTO shaft for the particular type PTO shaft on the tractor plus providing extended and/or retracted hitch pin hole dimensions.

2.3.4 **DRAWBAR EXTENDER**—An add-on bar or similar means attached to the tractor drawbar to lengthen the distance from end of PTO to hitch pin hole beyond the standard dimension.

2.3.5 **SHORT DRAWBAR POSITION**—A position intended to connect non-PTO driven equipment which applies a high vertical load to the drawbar.

2.3.6 **EXTENDED DRAWBAR POSITION**—A position intended for a special PTO driveshaft condition where equal angularity of the driveshaft joints cannot be obtained using the regular position.

2.3.7 **DRIVELINE CLEARANCE PLANE**—The imaginary horizontal plane which establishes the uppermost permissible limit of protrusion of the drawbar hitch assembly or any component thereof.

3. Specifications

3.1 The drawbar dimensions shall conform to Figures 1, 2, 3 and Tables 2 and 3.

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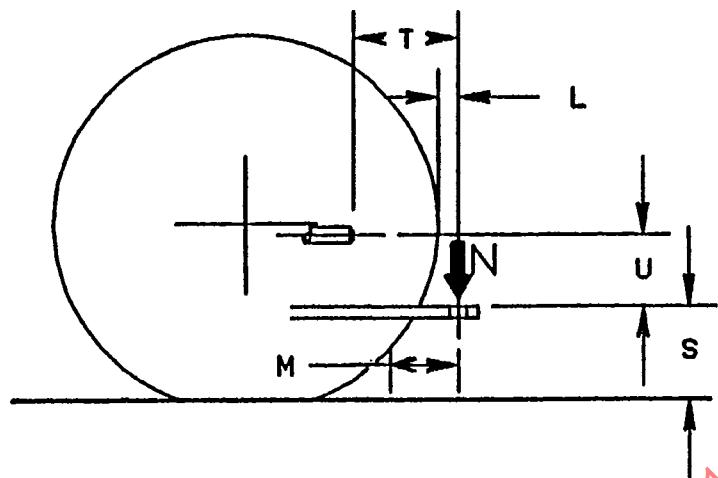


FIGURE 1—TRACTOR POWER TAKE-OFF AND DRAWBAR

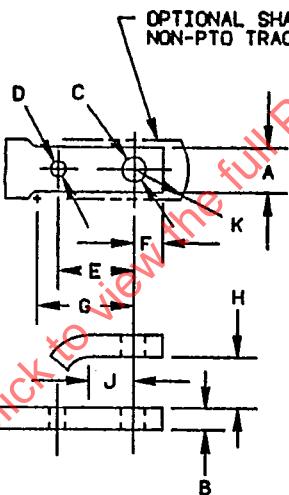


FIGURE 2—TRACTOR DRAWBAR AND CLEVIS

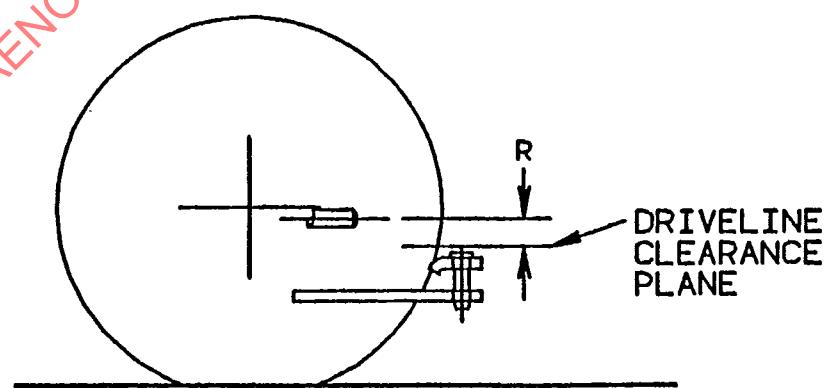


FIGURE 3—DRIVELINE CLEARANCE PLANE

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TABLE 2—DRAWBAR SPECIFICATION

Unless otherwise specified, all dimensions are in millimeters

| CATEGORY | I | II | III | IV |
|-------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| A Drawbar Width ¹ | 50 ± 1.0 | 60 ± 1.5 | 80 ± 2.0 | 120 ± 2.4 |
| B Drawbar Thickness (Max-Min) | 30-25 | 40-30 | 50-40 | 60-40 |
| C Drawbar Pin Hole Dia | 26 ± 0.25 ^{0.8} | 33 ± 0.25 ^{0.8} | 42 ± 0.25 ^{0.8} | 52 ± 0.25 ^{0.8} |
| C1 Nominal Drawbar Pin Dia | 25 | 30 | 40 | 50 |
| D Auxiliary Hole Dia | 21 ± 0.25 ^{0.8} | 21 ± 0.25 ^{0.8} | 21 ± 0.25 ^{0.8} | 26 ± 0.25 ^{0.8} |
| E Distance | 102 ± 0.8 | 102 ± 0.8 | 102 ± 0.8 | 130 ± 0.8 |
| F Distance (Max) | 30 | 40 | 50 | 60 |
| G Distance (Min) | 130 | 130 | 180 | 180 |
| H Height (Min) | No Clevis | 70 | 70 | 90 |
| J Distance (Min) | No Clevis | 60 | 70 | 80 |
| K Radius (Max) ² | 75 | 75 | 75 | 100 |
| L Horizontal Distance From Drawbar Pin Hole to Tire OD Min ³ | 25 | 25 | 25 | 25 |
| M Clearance for Clevis (min) | 200 | 200 | 200 | 200 |
| N Vertical Drawbar Load—kN | 1 + 0.15P | 1 + 0.15P | 7.8 + 0.06P | 11.2 + 0.04P |
| P Maximum Drawbar Power—kW | See 1.2 | See 1.2 | See 1.2 | See 1.2 |
| R Driveline Clearance Plane (Min) ⁴ | 200 | 200 | 220 | 250 |
| S Height of Drawbar (Min-Max) | 330-500 | 330-500 | 380-560 | 380-560 |
| U Drawbar to PTO-Vert | 200-300 | 200-320 | 220-350 | 250-350 |

¹ Width may be exceeded on tractors not equipped with PTO's but must be consistent with dimension K.² Clearance for implement clevis when drawbar width exceeds dimension A.³ With drawbar centered laterally and largest R1 tire specified by the manufacturer using SAE J711 tire dimensions.⁴ See 3.5.

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TABLE 3—POSITION AND VERTICAL STATIC LOAD FOR DRAWBARS

| PTO Type | T Short ¹ ± 10 | T Regular | T Extended ± 10 | N-Factor Applied to Table 2 Short | N-Factor Applied to Table 2 Extended |
|----------|---------------------------|-----------|-----------------|-----------------------------------|--------------------------------------|
| 1 | 250 | 350 | 500 | 1.6 | 0.8 |
| 2 | 250 | 400 | 550 | 1.6 | 0.7 |
| 3 | 350 | 500 | 650 | 1.4 | 0.7 |

¹ The L dimension does not apply to this position.

3.2 Dimension "L" in Figure 1 applies to the regular drawbar position for PTO usage.

3.3 Provision must be made for a safety chain intermediate support as specified by ASAE/ANSI S338.

3.4 The vertical location of the drawbar below the PTO centerline shall consider the drawbar pin, pin retention devise and clevis for the driveline clearance plane "R," Figure 3. The clevis may be removed to maintain the "R" dimension for PTO operation.

3.5 The drawbar hitch point shall be directly in line with the centerline of the tractor PTO shaft and provision shall be made on the tractor for locking the drawbar in this position.

4. Vertical Loads of Drawbars

4.1 The maximum vertical static loads which the implement shall impose upon the tractor drawbar are shown in Table 2. Loads for short and extended drawbar positions are shown in Table 3. The point of loading N, Figure 1, shall correspond to the regular, short or extended dimension as specified in Table 3. (The dynamic loads imposed upon the tractor drawbar and implement hitch will be considerably higher than static loads.)

5. Notes

5.1 **Marginal Indicia**—The (R) is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.

PREPARED BY THE AGRICULTURAL TRACTOR TECHNICAL COMMITTEE